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SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - APRIL 1980

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SOUTHWEST FISHERIES CENTER

LA JOLLA, CALIFORNIA

HONOLULU LABORATORY

LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - APRIL 1980

STATUS OF PUBLICATIONS

Published

Au, D. and D. Weihs. At high speeds dolphins save energy by leaping. Published in Nature 284(5756):548-550.

> An observer may wonder whether a school of 'running' dolphins, consisting of numerous, wildly splashing individuals, is using the most efficent mode of locomotion, because splashing wastes energy. Dolphins exhibit at least three modes of swimming. In leisurely, unhurried motion, they break the surface briefly and gently, often showing little more than the blowhole. At a faster, 'cruising' speed, frequently at 3-3.5 ms^{-1} (6-7 knots), the animals are seen swimming primarily just beneath the surface, and there is still little splashing. (Behavior and speeds of dolphin schools were observed from a helicopter and will be described elsewhere by D. Au and W. Perryman.) Swimming speeds in this mode have been measured up to 4.6 ms^{-1} (9.3 knots). But in the fastest 'running' mode, the animals clear the water in sequential, parabolic leaps, accompanied by considerable splashing on exit and re-entry. Leaps are interspersed with relatively brief, subsurface swimming. This swimming is common when dolphins are alarmed by vessels approaching within 500 m. We have examined dolphin swimming in terms of energy required per unit distance traveled and report here that beyond a certain 'crossover' speed, leaping must be more efficient than swimming.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Approved by Center Director

Adams, Michael F. A multispecies household production analysis of recreational fishing with dispositional benefits. For possible publication in Am. J. Agric. Econ.

D'Vincent, Susan, H. Geoffrey Moser and Elbert H. Ahlstrom. Description of the larvae and early juveniles of the Pacific butterfish, Peprilus simillimus (family Stromateidae). For publication in California Cooperative Oceanic Fisheries Investigations Reports.

Hobson, E.S. The structure of reef-fish communities in the Hawaiian archipelago. (Proc. Symposium on Status of Resource Investigations in the Northwestern Hawaiian Islands, April 24-25, 1980, University of Hawaii at Manoa, Honolulu, HI.)

Laurs, R. Michael and Jerry A. Wetherall. Estimates of growth rates for north Pacific albacore, Thunnus alalunga (Bonnaterre), based on an analysis of tag returns. For publication in Fishery Bulletin, U.S.

Mendelssohn, Roy. An iterative aggregation process for Markov decision processes. For possible publication in Oper. Res.

Webb, Paul W. and Robert T. Corolla. Burst swimming performance of anchovy larvae, Engraulis mordax. For publication in Fishery Bulletin, U.S.

Administrative Reports

Honolulu Laboratory

Yoshida, Howard O. and Hazel S. Nishimura. The costs of primary journals: A review. SWFC Adm. Rep. No. H-80-6.

Hudgins, Linda L. Economic analysis of Hawaii fisheries: A survey. SWFC Adm. Rep. No. H-80-7.

HONOLULU LABORATORY

RESOURCE ASSESSMENT AND DEVELOPMENT INVESTIGATIONS (RADI)

Honolulu Laboratory Scientists Participate in Northwestern Hawaiian Islands Symposium

Richard N. Uchida, Leader, Insular Resources Task, reported that he and several other researchers in the Task participated in the symposium on the "Status of Resource Investigations in the Northwestern Hawaiian Islands," which was held on April 24-25, 1980 at the University of Hawaii Manoa Campus. Uchida noted that the objectives of the symposium were to review original research objectives, review progress, and address information gaps and future research needs in the cooperative study of the Northwestern Hawaiian Islands (NWHI).

The program on the first day of the symposium included a welcoming address by Susumu Ono, Chairman, Board of Land and Natural Resources, who represented the Honorable George R. Ariyoshi, Governor, State of Hawaii; the keynote address by Dr. John P. Craven, Coordinator, State Office of Marine Affairs; and a speech by Richard S. Shomura, Director, Honolulu Laboratory, who spoke on the background events which led to the inauguration of the cooperative study of the NWHI.

The symposium proper was composed of presentations on preliminary research results of (1) "onshore research," including seabirds, monk seals, and turtles, (2) "nearshore research," including reef fish, ciguatera, corals, lobsters, and trophic studies, (3) "offshore research," including primary and secondary productivity, bottomfish and seamounts, pelagic fish, and genetics, and (4) "general," including refuge status, ecosystem modeling, socio-economics, and State master plan.

Uchida spoke on the Honolulu Laboratory's ongoing studies on spiny lobster, Panulirus marginatus; Research Assistant Bernard M. Ito, on ciguatera research; James H. Uchiyama, Fishery Biologist, on coastal pelagic resources; Research Assistant Robert B. Moffitt, on bottomfish research, and Dr. Jeffrey J. Polovina, Statistician, on ecosystem modeling.

In addition, William G. Gilmartin, Leader, Marine Mammal and Endangered Species Investigation, discussed monk seal research.

Cromwell Cruise Continues in Northwestern Hawaiian Islands

According to radio reports, the NOAA ship Townsend Cromwell, which is currently operating in the NWHI, experienced an extended period of rough seas and bad weather on the first leg of the cruise. Chief Scientist Reginald M. Gooding reported that they were forced to cancel several lobster predation experiments at Necker Island and Maro Reef owing to poor weather conditions.

Other work planned for the cruise includes a survey of several seamounts near Midway and Kure Islands. At Hancock Seamounts, Gooding reported that two night hauls with the Noreastern trawl produced 2,661 kg (5,800 lb) of armorhead, Pentaceros richardsoni, and 94 kg (200 lb) of alfonsin, Beryx splendens. The Cromwell searched for but failed to locate two other seamounts shown on existing charts. Relatively good catches dominated by red snapper, Etelis marshi, and sea bass, Epinephelus quernus, were made in modified deep water fish traps.

Other members of the scientific field party include Fishery Biologist John J. Naughton of the Western Pacific Program Office, Southwest Region, and Research Assistants Victor A. Honda, Robert L. Humphreys, Jr., Bert S. Kikkawa, and James H. Prescott. Naughton and Prescott disembarked and Research Assistant Alan R. Everson came aboard the Cromwell at Midway at the end of the first leg of the cruise. W. Gilmartin and other members of a monk seal study team are scheduled to embark the Cromwell at Midway in early May for transport to Lisianski Island where they will be making observations on monk seals.

* * * * * * * * * * *

Dr. J. Polovina collaborated with R. Uchida, J. Uchiyama and Research Assistant Paul M. Shiota to draft a research planning document for the assessment and evaluation of the fishery resources in the western Pacific within 200 miles of Guam and the Northern Mariana Islands.

Hawaiian Skipjack Tuna Landings Continue Below Long-Term Average

The April 1980 Hawaii landings of skipjack tuna were estimated at 32 metric tons (MT), which is 99 MT below the April 1979 landings and 143 MT below the 1964-79 long-term average for April. The cumulative landings from January through April were estimated at 122 MT, which is 238 MT below the 1979 landings for the same period and 370 MT below the 1964-79 long-term average for the same period.

Items from Seabird Spew Sent to Experts for Identification

Thomas S. Hida, Fishery Biologist, and Research Assistant Michael P. Seki, Young Adult Conservation Corps (YACC), continued to process seabird spew samples. Samples from the following groups were also sent to experts in the field for possible identification: crustaceans - Dr. T.B. Bowman, U.S. National Museum; Decapterus sp. - Dr. W. Smith-Vaniz, Academy of Natural Sciences, Philadelphia; and swordfish and marlins - Dr. Izumi Nakamura, Kyoto University, Japan.

Hida and Seki spent most of the month in identifying squid specimens. They were aided by Dr. Dick Young, University of Hawaii, in identifying several species in a common squid family.

FISH-ENVIRONMENT INVESTIGATIONS (FEI)

Behavioral Thermoregulation Studies of Tuna Continue

Dr. Andrew E. Dizon, Leader, Experimental Ecology of Tunas Task, and Research Assistant Martina K.K. Queenth continued to collect temperature preference data from small yellowfin tuna, Thunnus albacares. To date, four yellowfin tuna, approximately 40 cm FL (fork length) have been tested in the thermoregulation tank complex which is designed to measure the temperature preference of test animals. This system allows the test animal after a minimum training period, to control its environmental temperature by swimming between two adjacent tanks connected by a 30- x 30-cm hatch. If the fish is in the warmer of the two tanks (+2° C), both tanks heat at 1° C/hour (note: the 2° C tank differential is always maintained). Conversely, if the fish stations itself in the cooler of the two, the temperature drops at -1° C/hour. By movement between tanks, the test subject can drive its environmental temperature either up or down.

The initial fish (A) adapted quickly to the tank system, fed well, and learned to swim through the small hatch. After the initial familiarization period of 1 week, the fish was allowed to "take control" of its environmental temperature. It demonstrated a surprisingly accurate but high tank temperature preference centered around 27° C. The next two fish would not adapt to the tank complex; one would not feed and the other refused to pass through the hatch. The fourth fish (D) adapted satisfactorily and then controlled its tank temperature at around 27° C, but without the precision of fish A.

To test statistically the mechanism of thermoregulation, the tank situation was modeled to simulate a fish which was moving randomly between the tanks in the system without regard to temperature. Temperatures in the model would still rise and fall at 1° C/hour depending on the tank which the hypothetical fish was in, but the timing of the movement would be independent of the temperature. This is a typical "gambler's ruin" situation where ruin would occur when the upper or lower lethal temperature was reached. The rationale was that a fish in the test system would quickly cause the temperature to drift to one of these limits and would die.

However, in the computer simulation, fish were still able to keep the temperature of the tank complex between the "ruin" points even though they were moving from side to side without any temperature bias. All this required was a certain level of activity--about 5 minutes between passes. In fact, the simulation showed that 10 out of 1,000 fish moving at about 5 minutes between passes maintained modeled tank temperatures with equal or greater precision than the first fish. Dizon and Queenth have not had a chance to examine the

data from the fourth fish (D) as yet. Tests of several fish should reveal whether, in the real situation, fish are timing their passes from one tank to the other on the basis of temperature cues or are just moving randomly.

Active Respirometric Rates in Tuna Calibrated

During his work at the Kewalo Research Facility last August, Dr. Daniel Weihs (Department of Aeronautical Engineering, Technion-Israel Institute of Technology, Haifa, Israel) calculated that it took considerably more energy for a fish to swim a circular path than a straight one. This has serious implications in respirometry work since much data have been collected in circular respirometers that obviously force the test subjects to swim paths that have fairly small radii with respect to the fishes' length. Randolph K.C. Chang, Fishery Biologist, has been testing this effect to calibrate subsequent respirometric work and to verify Dr. Weihs' theoretical calculations. Work to date reveals a significant effect: at 1.6 body length/second, skipjack tuna consume oxygen at about 0.2 mg O_2/g hour less swimming in a 3-m radius tank than in a 1-m radius tank.

Ova Diameters of Captive Kawakawa Continue to Increase

In the effort to spawn tuna in the laboratory, M. Queenth reports that ova diameters of the captive kawakawa, Euthynnus affinis, have increased over those of last month. The greatest individual increase was from 0.183 to 0.258 mm. The average for this month was 0.195 mm as compared to 0.154 mm last month. The largest average individual diameter was 0.302. It is believed that an ova diameter of about 0.6 mm is required before hormonal injection will produce viable mature gametes.

DATA MANAGEMENT AND TECHNICAL SERVICES

Work Continues on Creating and Reorganizing Data Sets

Sally H. Kuba, Computer Programmer, assisted by Wayne Ogawa, Computer Aid, YACC, is reorganizing the Honolulu Laboratory magnetic tape library for backup and recovery purposes. In addition, work is continuing on converting old card files to magnetic tape files and documenting data sets, validating and reformatting them as necessary.

Lucille T. Tsukano, Computer Aid, was assisted by Karen Wendel and Colleen Nagato, Computer Aids, YACC, in coding and verifying ciguatera data and longline and handline fishing data from the western Pacific.

Also, a first order inventory data base which was completed earlier by Rick Rogers, former YACC Computer Aid, was used to locate cruise and narrative reports relative to a request for information from the Bishop Museum and the

Lawrence Laboratory at Berkeley, California. The Bishop Museum request involved a transfer of invertebrate specimens from the Honolulu Laboratory collection to the Smithsonian Institution. The Lawrence Laboratory request was made through the Department of Oceanography, University of Hawaii, for bathythermograph data around the island of Hawaii to be used as background data for the mini-OTEC project.

* * * * * * * * * *

George W.T. Liao, Operations Research Analyst, Hazel S. Nishimura, Librarian, Wendel and Nagato met with Dr. John Byrne, U.S. Fish and Wildlife Service, Portland, Oregon who demonstrated a new bibliographic data base, Pacific Islands Ecosystem (PIE), which presently contains 20,000 citations. During the demonstration, sample searches were conducted on tagging and marking experiments on turtles and marine mammal assessments. While still a private file, PIE will shortly be available to current subscribers of System Development Corporation's ORBIT. During the next update of PIE, references to Honolulu Laboratory-originated papers will be included, as keywording by Research Assistant Andrew J. Aldridge is completed.

Liao also met with Lonnie Goldman, Chief, U.S. Coast Guard (USCG) Data Processing Branch, on the feasibility of a direct 2400 bank link to EMIS and alternatives of USCG access to EMIS and with Cdr. Ben Chiswell and Lt. Steve Wolf to discuss real-time telex message switching for WPPO/EMIS.

System Development Project Underway

With assistance from Fletcher V. Riggs, Fishery Biologist G. Liao reported that he drafted specifications for a remote job entry (RJE) station and sent the specifications to more than 24 prospective respondents. Liao also reported that the final version of the Agreement of Understanding for the Fishery Information Network (FIN) in Hawaii was drafted by the Hawaii State Division of Fish and Game and sent to the State Attorney General for legal review. A budget plan detailing intended use of initial FIN funds was submitted to NASO Procurement.

Liao is working with Chuck Dinkel, Fleet Operations, National Ocean Survey, to test a message switching feature of the DEC-10 as a possible communications platform for the Townsend Cromwell CAMAC system. He also participated in a successful international teleconferencing session using the Electronic Information Exchange System (EIES) and later used the system to contact Cheryl Alexander of EDIS, NOAA, for more information.

Liao also prepared and distributed to the Honolulu Laboratory staff a questionnaire on word processing requirements. Lynn Hondonero, YACC Computer Aid, is assisting Liao in summarizing and compiling the data.

Activities of Personnel in Foreign Fishing Vessel Observer Program (FFVOP)

Ray F. Sumida, Fishery Biologist, worked with Svein Fougner, Southwest Region (SWR) and Eugene Nitta, Western Pacific Program Office, SWR, to complete a bilingual data collection form for the use of personnel in the Foreign Fishing Vessel Observer Program (FFVOP) in connection with the billfish Preliminary Management Plan.

A. Everson provided Financial Reporting System (FRS) training to Wendel and Nagato and began a bibliographic search for research projects around Guam.

A. Aldridge provided introduction training on EMIS/1022 to Lt. Jim Lachowitz, Assistant Chief, Office of Intelligence and Law Enforcement, USCG 14th District. Aldridge and Research Assistant Nathaniel T. Shippen continued to document and debug computer programs on test FFVOP and related files. They also instructed YACC personnel in System 1022 techniques.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

Warm Water Pool in Pacific May Be Responsible for Storm Damage in California and Changed Fish Migration

For the past two winters, the once predictable weather engine in the Pacific has been warming up, changing the lives and habits of both fish and people. Oceanographers and meteorologists at the Center who keep a close watch on ocean temperatures in the Pacific have recorded abnormally high sea surface temperatures off the west coast of North America since November 1979.

According to Dr. M. Laurs, Oceanographer at the La Jolla Laboratory and Forrest Miller, Meteorologist with the Inter-American Tropical Tuna Commission, the warm water covers a vast area (about 2 million square miles) of the Pacific Ocean, from about the tip of Baja California, Mexico to Vancouver Island in British Columbia and seaward to about the Hawaiian Islands. The information collected by scientists here interested in the migration and distribution of tunas shows that the warm water phenomenon has been greater south of Cape Mendocino than to the north and as deep as 50 meters throughout.

Laurs and Miller believe that there are several reasons for the formation of this pool of warm water in the eastern North Pacific. As the result of complex air-sea interactions, there has been an apparent reduction of heat loss in ocean surface layers during the winter months. In addition, a large pool of warm water which developed during the late summer of 1979 remained in place along the entire Pacific West Coast of the U.S. Also noted by oceanographers was a horizontal movement northward of warm waters from the central and tropical areas of the Pacific and a virtual shut down of the traditional coastal upwelling.

The warm ocean conditions in the eastern Pacific were associated, said Laurs and Miller, with unusual patterns of atmospheric pressure distribution. Normally, during the winter months the Aleutian low pressure center is located in the vicinity of the Aleutian Islands and the eastern Pacific high pressure center is found near 30° N, 130° W. The storm systems usually build up between 35° N and 45° N and then move eastward with strong surface winds, heavy rains and wide bands of clouds.

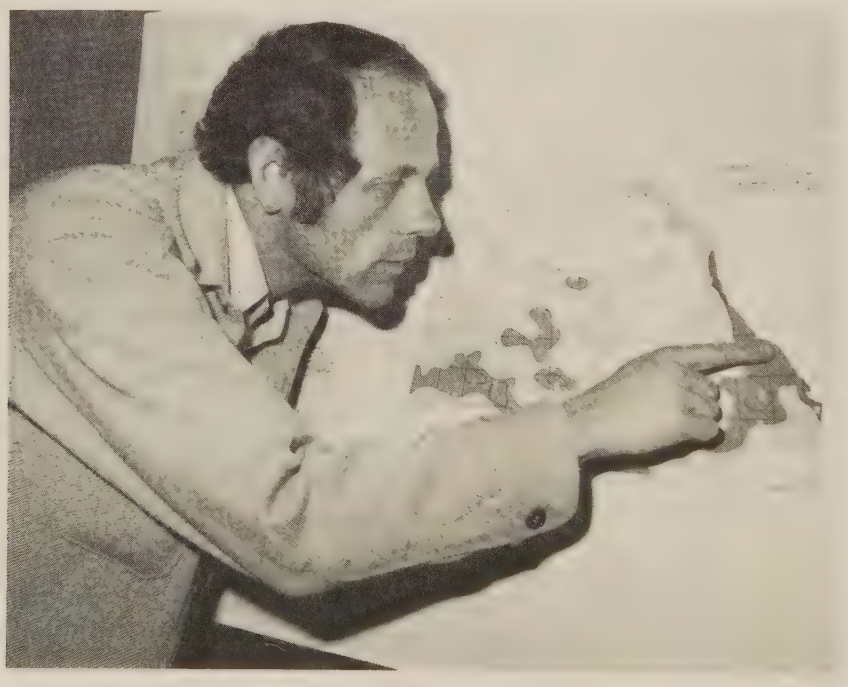
During most of the winter months this year, however, the Aleutian low pressure center shifted 600 miles south of its normal position. At the same time the Pacific high pressure system weakened and was displaced 300 miles southeast to a position off southern Baja California. Thus, the entire eastern North Pacific (between 20° N and 50° N) was dominated by the displaced Aleutian low circulation and resulted in a reduction in the seasonal heat loss in ocean surface waters in the eastern North Pacific. The stage was thus set for one of the most severe winters of rains and floods over the southwest U.S. and Baja California in 40 years, and torrential rains in Hawaii. Storms

developed frequently over the central Pacific and then moved along tracks far to the south of those during the normal winter months. As the storms approached the west coast, the large pool of warm ocean water (3° to 5° F above normal) provided additional heat and energy which fueled heavy winds and rains over southern California and Baja California).

Laurs and Miller believe that the forces which were responsible for warm water conditions during the winter of 1978-79 were very similar to those operating in the wet winter of 1979-80. During the 20 years that scientists at the La Jolla Laboratory facility have been monitoring ocean temperatures in the Pacific, there have never been two successive winters with such persistent and large departures from normal sea surface temperatures.

The effects of these devastating winter storms have been all too apparent in southern California with heavy damage to homes, crops and lands at a cost of hundreds of millions of dollars. The consequences to fish, Barrett pointed out, are more difficult to assess. The present ocean climate, biologists theorize, benefits the survival of such fishes as the rockfish and the northern anchovy, while the migratory albacore and salmon may change the direction of their travel paths in the ocean, making them less available to the commercial and sport fisherman.

(The above news release, issued on April 23 from the Southwest Fisheries Center in La Jolla, was written by Dr. Laurs, Mr. Miller, Dr. Reuben Lasker and L. Vlymen and appeared in local newspapers. It was also the subject of discussion on local TV news shows.)



Dr. R. Michael Laurs, Oceanographer at the La Jolla Laboratory, points to extensive area of warm water in the Pacific.

Study Indicates Sanddabs Use Sea Floor to Improve their Ability To Accelerate, thus Avoiding Predators

Dr. Paul Webb, NRC/NOAA Post-Doctoral Fellow at the Southwest Fisheries Center this year, has concluded a study on the use of the sea floor by sanddabs, Citharichthys stigmaeus, to improve their ability to accelerate in avoiding potential predators, and in catching elusive prey. Fish were held in an observation chamber with a false bottom grid located 0, 1, 3 or 6 cm above the true bottom. By comparison of acceleration fast-starts from the grid at various distances above the ground and in the water column free from the ground, it was possible to identify use of pushing against the ground and hydrodynamic ground effect on performance capabilities. Fast-starts were initiated by a 1 $v.cm^{-1}$ D.C. electric shock. No use of hydrodynamic ground effect could be detected. The presence of a solid substrate eliminated most problems of recoil, i.e., the energy wasted in lateral movements of the head due to tail side-forces. As a result of interaction with the floor, performance was enhanced in comparison with fish accelerating in the water column. Thus the unique morphology and behavior of flatfishes confer distinct mechanical advantages to swimming in comparison with other benthic fish.

Experimental work has been completed on the response of larval anchovy, Engraulis mordax, to attack by a "model" fish predator, the clown fish Amphiprion percula. The model was used in these experiments concentrating on predator avoidance because of problems in supply and availability of natural predators of appropriate size for the duration of experiments. Preliminary analysis suggests larval responses are energetically optimal, and that response thresholds decline with increasing length.

Work has also begun in cooperation with Dr. Ray Keyes at Sea World to study the locomotor behavior and mechanics of large sharks.

LARVAL FISHES, COASTAL EAST PACIFIC

Research Cruise for Defining Vertical Distribution of Eggs & Larvae Completed

One of several research cruises conducted this spring by the Coastal Fisheries Research Division was made possible by the loan of the research vessel Ellen B Scripps from the Scripps Institution of Oceanography. The cruise was a cooperative effort with Dr. Tilman Pommeranz of the Institut fur Meereskunde, University of Kiel, West Germany for the purpose of defining the vertical distributions of eggs and larvae of the northern anchovy and other important species of fishes.

The 40 years of California Cooperative Oceanic Fisheries Investigations plankton surveys have produced a data series that is unmatched in duration, areal coverage and sampling intensity, however, only a limited number of tows made during this period have sampled discrete vertical strata. In 1959 Dr. E.H. Ahlstrom compiled data from all available vertically stratified tows and

summarized the patterns of vertical distribution of eggs and larvae of the abundant species found in the CalCOFI region. Our present research requires more detailed replicative data on the vertical distribution of eggs and larvae of the northern anchovy and other species, particularly with respect to time of day and stage of development, and it was for this purpose that the cruise was conducted.

Two sampling sites in the Southern California Bight were chosen--CalCOFI station 90.38, a deep water site west of Catalina Island, occupied March 19-28 and station 90.28, a nearshore site just north of Dana Point, occupied March 29-April 6. The principal collecting device was the MESSHAI, a multiple high speed zooplankton sampler, developed and supplied by Dr. Pommeranz. The MESSHAI is capable of collecting 5 discrete samples and continuously telemetering sampler depth, temperature and water flow inside and outside the mouth opening for display, disc storage and processing. Each day and each night while on station the MESSHAI was deployed three times; two tows were made in the upper 50 m, sampling 10-m strata, and one deep tow sampled the upper 200 m in 40 m strata. The MESSHAI performed flawlessly during the 63 total tows. Other activities carried out during each day and night sequence were: 1) a particle count using the free-fall particle counter, 2) a chlorophyll profile taken to a depth of 40 m using the Lasker pump with water samples taken at the surface and at the chlorophyll maximum for chlorophyll a and phaeophytin extraction and fluorometry and for organism identification, 3) two surface tows using a Manta Net, 4) a standard CalCOFI oblique tow using a Bongo Net, and 5) a discrete sample from 400 to 200 m using an opening/closing Bongo Net.

The sampling schedule required a 24-hour operation for the eight-person scientific crew consisting of Pommeranz (Chief Scientist), H.G. Moser (Cruise Leader), Jack Brown, John Butler, Carol Kimbrell, Barbara Sumida- MacCall, Elaine Sandknop and Betsy Stevens. At the nearshore station, operations were coordinated with Dr. Michael Mullin (Food Chain Research Group, SIO), aboard the M/V Fisherette, who made day and night pump stations simultaneously with the MESSHAI tows. The Fisherette arrived on station at about 0900 and 2100 and took a vertical series of microzooplankton pump samples to 50 m with 5-m intervals. Prior to each of their pump series, information on the chlorophyll profile was communicated to them by radio.

The 169 plankton samples with extensive associated environmental data represent the first replicative fine scale vertically stratified series taken in the CalCOFI region. The value of the data was enhanced by the major storm and associated heavy seas that interrupted the cruise on April 1, and forced the boat to take shelter at Long Beach. The station was occupied again from April 3-6. Chlorophyll profiles taken on station 90.28 indicate that a phytoplankton population "event" occurred during the time of station occupancy. Prior to the storm, there was a strong chlorophyll maximum ranging from 22-29 m. Following the storm the chlorophyll peak became shallower and weaker. It was at 15 m on the morning of April 3 and by the evening of April 4 had disappeared, with a weak surface maximum. On the following two days the peak reappeared and began to deepen. The fortuitous storm provided the opportunity to examine the effect of water column mixing on the vertical distributions of eggs and larvae of anchovy and other species. The same holds

for invertebrate species which will be available to SIO investigators. Also, the possible effect of the storm and associated changes in the phytoplankton community on larval growth and age may be studied by morphometric analysis and by analysis of the otoliths. The storm may also provide additional evidence for the Lasker "stability" hypothesis that first-feeding anchovy larvae need stable (non-turbulent) conditions in their environment to insure that food would be available in the proper concentrations. Storms and upwelling events disrupt these larval food aggregations which could produce heavy larval mortality during the anchovy spawning season. The following figures show:

A. Dr. Tilman Pommeranz attaching safety clamp to MESSHAI.

B. The MESSHAI being deployed by (left to right) John Butler, Fishery Biologist, Dr. Pommeranz and Jack Brown, Electronics Engineer, with Barbara Sumida-MacCall, Fishery Biologist, operating the conducting cable winch.

C. MESSHAI tow in progress with Jack Brown at operator console and Elaine Sandknop, Fishery Technician, timing step intervals. Visible in the picture are data plotting, storage and processing units.

D. Plotter showing sampler depth and flow meter traces.

E. Carol Kimbrell, Fishery Biologist, operating conducting cable winch using hand signals given by the timer and console operator.

F. Carol Kimbrell removing cod end magazine at completion of tow.

G. Carol Kimbrell and Elaine Sandknop processing MESSHAI samples in wet laboratory.

H. Close-up of individual MESSHAI sample bucket being washed down prior to preservation.

I. Betsy Stevens, Fishery Technician, processing chlorophyll samples.

J. Deck of R/V Ellen B. Scripps, April 1, 1980 enroute to Long Beach.

A
B
C
D

E

F

G

H

I

J

Existence of Photorepair Verified in Larval Anchovy

Dr. John Hunter and Sandy Kaupp of the University of California, San Diego, report that their recent work has verified the existence of photorepair of UV-B induced damage in larval anchovy. Photorepair is the restoration of ultraviolet radiation lesions with light of wavelength longer than that of the damaging radiation. The wavelengths usually effective in producing repair lie in the blue-violet and near-UV region of the spectrum (UV-A). They demonstrated photorepair in anchovy by comparing the survival of larvae exposed to UV radiation during the first 6 h of a 12-h (white light) day to those exposed to UV radiation during the last 6 h of the day. It required twice the UV dosage to produce the same mortality when UV exposure was given over the first 6 h. Thus, exposure to 6 h of white light immediately after a 6 h UV exposure greatly increased survival and demonstrates the existence of photorepair. In addition, larvae surviving the first 6 h exposure were larger than those surviving the same UV dose during the second 6 h. The existence and function of photoreactivating enzymes has been shown in fishes in other studies, but this is the first time this process has been directly linked with survival and growth of fishes.

They also evaluated the total incident energy required for full activation of photorepair. They found that photorepair appeared to be fully activated at fluences that were equivalent to about 1/10 of the energy available from the sun (320-500 nm, late March or early April day in our latitude, 32.5° N). As energy available for repair attenuates with depth more slowly than does UV-B radiation, and only 1/10 of the available energy at the surface is needed, it appears that photorepair will operate maximally even under the added stress of enhanced UV-B from ozone depletion.

Birthdate Distribution Estimated for Juvenile Anchovy of the 1979 Year-Class

An initial estimate of the birthdate distribution of the 1979 anchovy year-class has been made by Richard Methot, graduate student at Scripps Institution of Oceanography, using daily growth increments laid down in the otoliths of juvenile anchovy collected by trawl in August 1979. Fish in the 70-80 mm size range were most abundant and were born primarily in January 1979. This is in contrast to the 1978 year class, most of which came from March-April 1978 spawning.

The August 1979 survey was limited in geographic coverage and undersampled fish born after March 1979 because they were smaller than 50 mm. Further analysis of the 1979 birthdate distribution will be based on samples from 138 trawls taken by Ken Mais of the California Department of Fish and Game in November 1979 from Blanca Bay, Baja California to Point Conception, California.

ALBACORE FISHERIES PROGRAM

Analysis of Tracking Experiment Yields New Information on Albacore Depth Distribution

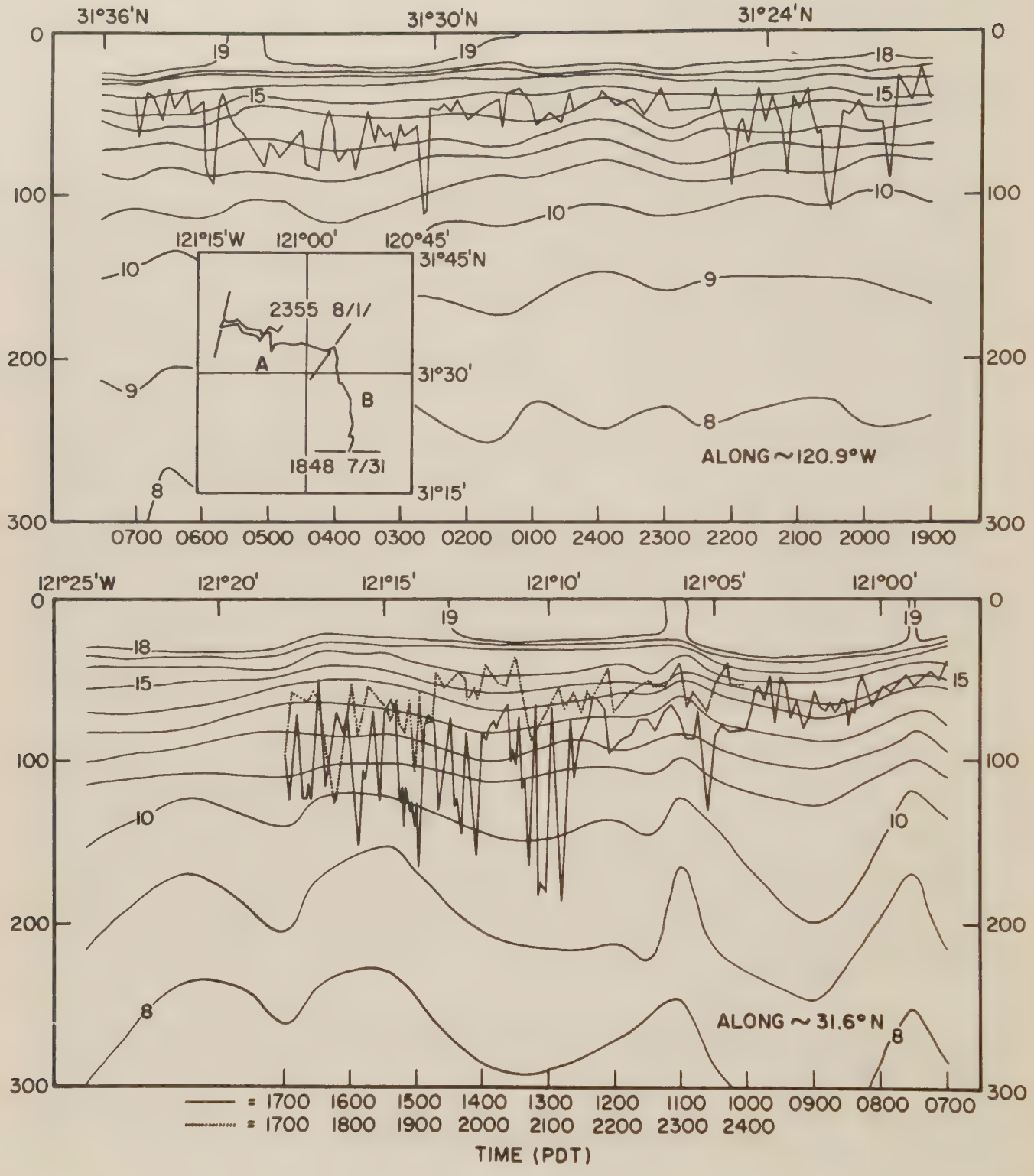
Off southwest San Diego in August 1979, the fishing vessel, Linda, conducted ultrasonic tracking of albacore tuna while concurrent oceanographic observations were taken by scientists aboard the NOAA research vessel, Jordan. The objective was to examine the small-scale movements of albacore, their depth distribution and water temperature at swimming depth, and to evaluate the effects which oceanographic conditions may have on the local concentrations and movements of albacore. Information on swimming depth (2 fish) or water temperature (1 fish) was telemetered from sensors attached to free-swimming fish. In addition, data on ocean vertical distribution were collected with XBT's.

Analyses were recently completed of the data collected during this study which was conducted cooperatively by scientists from the SWFC's La Jolla and Honolulu Laboratories. Dr. M. Laurs, Leader of the Albacore Fishery Program at the La Jolla Laboratory, and Dr. Andy Dizon, Leader of the Tuna Physiology program at the Honolulu Laboratory, report that the tracking experiment yielded important new and surprising information on albacore depth distribution and on ocean temperatures where albacore swim. The tracked fish spent virtually no time in the upper mixed layer where it is generally believed immature albacore are distributed. The fish spent much of their time in the thermocline and were often observed well below the thermocline. The fish spent the majority of the time in waters 2° to 5° C below the low end of the published range of optional temperature preferences (15-20° C).

During the experiment fish spent some time in temperatures as low as 9.5° C and much time in waters with temperatures between 10-12° C. Results also suggest that variations in vertical distribution of fish apparently migrating are different from fish that do not see to be migrating. A fish which appeared to be migrating exhibited relatively small vertical excursions in depth and showed little day-night difference in depth distribution. Whereas, a fish which appeared not to be 100 m, the amount of vertical swimming activity was significantly greater during hours of daylight than hours of night, and the depth distribution during daylight was significantly deeper than during nightime.

In addition to Laurs and Dizon, A. Jemison of the Honolulu Laboratory and Ron Dotson and Stephanie Revesz of the La Jolla Laboratory participated in the experiment.

The figure below shows the depth distribution of one of the fish tracked and the vertical temperature distribution at the time of tracking.



Depth distribution of albacore tuna derived from acoustic tracking and the vertical distribution of temperature.

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION

Mexico May Cooperate with U.S. in Test of Egg Production Method to Assess Anchovy Biomass

As part of the continuing cooperation in marine research with Mexico under the umbrella of the Instituto Nacional de Pesca/California Cooperative Oceanic Fisheries Investigations, Drs. Lasker and Smith attended a meeting in La Paz, Baja California, April 21-23, with Dr. Jorge Carranza and his associates. Also attending this meeting were CalCOFI Coordinator George Hemingway and SIO Administrator Richard Schwartzlose.

Lasker presented the latest information to the group on the egg production method and pointed out the disadvantages and advantages of both the larval survey method and the egg production method. With help from Dr. Smith, technical details of the egg production method, e.g. egg staging, follicle identification, precision in sampling, size of the CalVET net, method and speed of sampling, were discussed. There was considerable interest in this technique and a cooperative venture may be undertaken to test the method on the southern subpopulation of anchovy or on the central subpopulation in Mexican waters.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

43-Day Anchovy Egg/Gonad Survey for Estimating Anchovy Spawning Biomass Completed

Fishery Biologist Gary Stauffer reported that the 1980 CalCOFI survey designed specifically for estimating anchovy spawning biomass, using the egg/gonad method developed at the Southwest Fisheries Center over the past 2 years, was completed on April 29. The 43-day survey consisted of 969 stations; 966 vertical egg tows were taken, 94 oblique bongo tows, and 48 midwater trawl tows over an area from 30° N off Punta Baja to 38° N off San Francisco.

The samples from the survey are being processed on a priority basis by a team of researchers from various Coastal Division programs. The method, as proposed by Statistician Keith Parker, formerly of the La Jolla Laboratory, is theoretically superior to the estimation procedure used in previous years in that all parameters have a biological interpretation and can be estimated from the survey data. Preliminary comparison of the results of the egg/gonad survey with the cooperative U.S.-U.S.S.R. survey conducted by the Soviet research vessel, Tikhookeanskiy, in March showed that the warm waters and the coastal anchovy spawning north of Point Conception did not persist into mid-April. Major coastal upwelling resulted in significantly lower water temperatures (less than 13°) for most of the area. According to William Flerx, cruise leader on the Jordan, anchovy spawning activity in April, unlike March, occurred only north of Point Conception in the very nearshore region

shallower than 50 fathoms. In the southern survey area off the northern Baja coast, water temperatures exceeded 16° in many places, which hastens develomental rate of anchovy eggs. The offshore distribution of anchovy eggs was limited to station 60 within the L.A. Bight and to a narrow coastal band off Baja California. An estimate of spawning biomass is scheduled to be completed in time for the summer deadline (July 1) and annoucement of the 1980-81 anchovy catch quota.

U.S.-Soviets Cooperate in Jack Mackerel Survey

The second leg of the cooperative U.S.-U.S.S.R. cruise aboard the Soviet research vessel Tikhookeanskiy was completed April 11, according to Gary Stauffer. The primary objective of the second leg was to survey offshore of southern and central California for jack mackerel. There were few indications of jack mackerel from acoustic and ichthyoplankton sampling. One midwater station west of Point Conception resulted in a catch of 650 large jack mackerel. A frozen sample of 100 fish and 50 female gonads were saved for stock identification and spawning frequency studies by Roger Hewitt, NOAA Corps Officer.

Statistics of Egg/Gonad Estimate Explored

During April, Susan Picquelle, Statistician, continued her study of various aspects of the Parker biomass estimate based on the egg-gonad survey of anchovies. In particular, she examined methods for estimating ratios and proportions which are needed to estimate the sex ratio (weight of females weight of males and females) and spawning fraction (proportion of females exhibiting day-old post-ovulatory follicles, indicating the female spawned between 24 and 48 hours prior to being caught). In an attempt to compare the estimation procedures, she applied these methods to a test data set taken from the February 1978 trawl survey data.

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Economist Jane McMillan reported additional progress in data manipulation for her study of vessel construction in U.S. fisheries. The work completed this month involved generating computer data files for further analysis.

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Dr. D. Huppert, Task Leader, continues to work on several projects including the preparation of lectures for a course at Scripps Institution of Oceanography (SIO #279), "Analytical Methods in Fisheries Management," development of recreational fisheries analysis (with Cynthia Thomson), evaluation of recruitment surveys for anchovy, and coordination with University researchers. Regarding this last item, two new developments have

occurred. Prof. Warren Johnston and graduate student Jerry Fletcher from UC Davis visited the Center April 28 to May 2 to examine possible uses for the Coastwide Data File (fish ticket data and vessel identification data from Washington, Oregon and California for 1974-1976). Fletcher is preparing a Ph.D. dissertation project involving a multispecies analysis of northern California crab/albacore/salmon vessels. During his stay at the Center, Fletcher worked with Bob Butler of the ADP Unit at La Jolla to extract the pertinent data. This is evidently the first use of the Coastwide Data File. Mike Phillips, graduate student in economics at UCSD, is being hired for this Task as an intermittent student employee in order to encourage his application of advanced forecasting and econometric analysis to problems of fisheries management.

Oceanic Fisheries Resources Division

TUNA AND BILLFISH RESOURCES PROGRAM

Program Personnel Return Upon Completion of Skipjack Tagging Cruise

The last leg of the Program's Atlantic Skipjack Tagging Cruise ended in Curacao, Netherlands Antilles on April 18, 1980. Center personnel, Dick Evans, Oceanographer, who participated in the last leg of the cruise, and Dave Bickford, Biological Technician, who worked aboard the baitboat for the entire cruise, left the ship in Curacao and returned to La Jolla. The tagging vessel, the Rhonda Sue, which left San Diego on January 12 is scheduled to return to San Diego on or about May 10, 1980. Gear used on the cruise will be offloaded at that time. Data from the cruise are currently being edited and are expected to be ready for analysis in June.

Bluefin Tuna Study Begins Under State Contract

Dr. Norman Bartoo, Fishery Biologist, reported that Doyle A. Hannan, a California Department of Fish and Game (CF&G) Marine Biologist, has begun work on a contract recently awarded to the State to study Pacific bluefin tuna. Hannan will assemble, for ready access, all bluefin tuna data that are in the CF&G files and analyze the data. Specifically, he will compile a complete set of bluefin tuna data from CF&G files on tags released, tags recovered, sample catch and effort, landings, number and size of boats, size and age of fish caught and fishing areas for approximately the period 1957-1972 in a computer data base compatible with the Southwest Fisheries Center system, document the contents of the data base and, ultimately produce a document describing the fishery.

Hannan is currently working on organizing existing bluefin tuna data and completing a literature search. Time has been spent in CF&G offices in Long Beach sorting tuna records including vessel logs and summaries of data, some dating as far back as 1916.

Tuna Vessel Participation
in FAX Advisory Program

During March 1980, 25 tuna seiners contributed synoptic weather data to the NMFS FAX Advisory Program, a total of 315 weather and 3 XBT observations were reported via NMFS-licensed radio station WWD. The table below lists program participation during March 1979 and 1980.

	March 1979	1980
Number of vessels with equipment	48	45
Number of vessels reporting	27	25
Number of weather observations reported	334	315
Number of XBT observations reported	11	3
Total Observations	345	318

Leading all program participants this month were the captains and crews of the Jo Ann and Santa Rosa. We wish to thank these and all other contributors.

MARINE MAMMAL ASSESSMENT AND MONITORING PROGRAM

Decision by Administrative Law
Judge Due in Early July

Dr. Tim Smith, Leader of the Marine Mammal Assessment and Monitoring Program, traveled to Washington, D.C. for the final two days of testimony of the hearing before Administrative Law Judge Hugh Dolan on proposed porpoise regulations. The hearing began March 31 to April 5 in San Diego, during which Dr. William Aron, Dr. William Perrin, Smith and Lcdr. Wayne Perryman gave testimony. Perryman testified at the request of Judge Dolan to clarify certain aspects of the aerial survey and some research vessel surveys. One notable result of the hearing has been that IATTC information on number of sets by species of porpoise has been made available. Information given in testimony prepared by Frank Alverson of LMR is currently being reviewed by a joint working group consisting of Smith, Alverson and Dr. Robin Allen of the IATTC staff. They are being assisted by Susan Boyer of Potomac Research Institute. Results of this evaluation, and of a parallel review of certain details of the 1979 abundance estimates by Drs. Holt and Smith of SWFC, Drs. D. Chapman and L. Eberhardt of the U.S. Marine Mammal Commission, and G. Broadhead of LMR, will be presented to the Administrative Law Judge on May 19, 1980. After this date, the hearing schedule provides for a recommended decision by July 7, 1980.

Study of Marine Mammal Sighting and Effort Data Underway

A major cause of concern during the Administrative Law Judge hearings on porpoise regulations was that the sighting data, which has been collected since 1974 aboard tuna vessels, has not been adequately analyzed for relative abundance of porpoise. Preliminary efforts to help resolve this problem were initiated by the staff of this program in May 1979 with Dr. Phil Hammond of the IATTC. This work is now continuing with a contract for computer programming to Jay Walker of Potomac Research Institute. Thus far Walker has been developing programs for plotting these data geographically. With Frank Ralston of the La Jolla Laboratory he will be developing editing routines to check the inter-data base consistency of several streams of data collected aboard the tuna vessels. This work will be followed with an intensive analysis aimed at estimating relative density of porpoise schools, both spatially and over time, and aimed at describing searching effort by the tuna vessels for possible use in catch-per-unit effort measures of abundance.

DeMaster to Participate in Monk Seal Recovery Team

The newly created Hawaiian Monk Seal Recovery Team, under Dr. William Gilmartin of the Honolulu Laboratory, had its first meeting in late April. Dr. D. DeMaster of the La Jolla Laboratory is assisting in that work, whose objective is a plan for the recovery of the Hawaiian monk seal. Special emphasis will be on developing a comprehensive research program to be run from the Hawaii Laboratory. DeMaster's experience with other pinnipeds will be valuable here.

Extensive Study of Equatorial Cetaceans Conducted from NOAA Research Vessel, Oceanographer

Marine mammal observers R. Pitman and S. Sinclair disembarked at Kwajalein Atoll from the NOAA research vessel, Oceanographer, on April 19 after surveying the abundance of cetaceans, primarily along the equator between 110 and 180° W, the first time that such an extensive study has been conducted in equatorial waters.

The observers reported frequent sightings of Fraser's, Lagenodelphis hosei, and Electra, Peponocephala electra, dolphins, species usually regarded as rare. From these observations it is apparent that these dolphins are mainly equatorial in distribution.

Pitman and Sinclair also observed many Ziphius cavirostris (Cuvier's beaked whale) and Kogia (probably K. simus, the dwarf sperm whale), species not generally considered equatorial. Kogia is also another of the cetacean species heretofore regarded by experts as rare.

Tunas seen in these equatorial waters were seldom associated with any dolphin species. These observations indicate that the oceanographically district equatorial water is the habitat of a unique cetacean community.

Pitman and Sinclair joined the scientific party aboard the Oceanographer at San Diego on March 21. The Oceanographer is carrying out an Equatorial Pacific Ocean Climate Study (EPOCS) along the equator.

MARINE MAMMAL BIOLOGY AND TECHNOLOGY PROGRAM

Study Shows Yearly Accumulation of Dentinal Tissue in Dolphins Decreases at a Uniform Rate with Age

Dr. Al Myrick presented a briefing this month to his colleagues in the Oceanic Division on the status of his research on age determination using real time calibrations from experiments conducted on captive dolphins. Myrick has completed a report on results of the first 6 months contract study with the Hubbs-Sea World Research Institute involving extraction of teeth from captive dolphins which had been injected with tetracycline. The antibiotic is taken up by the teeth, thereby serving as a marker for layering studies. The analysis indicates that the total yearly accumulation of dental tissue decreases at a uniform rate with the age of the animal. It is not affected by water temperature, veterinary handling, transportation, food consumption or water salinity. The yearly accumulation changes seasonally and probably is controlled endogenously, reinforced by day length.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Rockfish Sampling Program Ends Successful First Month

Tina Echeverria, Fishery Biologist with the Rockfish Analysis Task, reports that about 90 samples of rockfish have been collected from landings between Morro Bay and Crescent City, California, since the six-month rockfish sampling project began at the end of March. Otoliths and viscera have been collected from about 1,250 fish. Approximately half of the material has been processed at the Tiburon Laboratory for state of maturity, age, and presence of juvenile prey. Examination of early results has resulted in modification of the processing procedure for increased efficiency.

Early Results from Rockfish Fishery Indicate that 1977 Year-Class of Bocaccio is Strong

Dr. William H. Lenarz, Leader of the Rockfish Analysis Task, reports that results of sampling rockfish landings indicate that the 1977 year class of bocaccio is indeed quite strong. The November-December 1978 issue of the Monthly Report contained an article on the findings of NMFS and California Department of Fish and Game employees that juvenile bocaccio, blue rockfish, and brown rockfish of the 1977 year class were unusually abundant in nearshore waters. The article predicted that if year class strength is determined by the juvenile stage, the 1977 year class of bocaccio, which is the most important commercial rockfish in California, would begin to make significant contributions to the catch by 1980. Significant numbers of the year class began to appear in some samples from Monterey, California in 1979. The year class has dominated landings in all parts sampled in 1980 by the six-month study described in the preceding article. While the results are far from conclusive, they are a positive indication that year class strength is determined by the time that some species of rockfish appear in relatively easily sampled nearshore habitats. Brown and blue rockfish are not expected to contribute significantly to catches prior to 1981.

FISHERIES DEVELOPMENT INVESTIGATION

Euphausiid Fishing Launched

Fishery Biologists Sus Kato, Daniel Ralph, and Lt. Patrick Rutten of the NOAA Corps traveled to Monterey, California on April 10, 1980 to install a Furuno net recording system aboard the fishing vessel, San Giovanni II. The system is needed to monitor net position during midwater trawling expeditions for shortbelly rockfish and euphausiids.

Kato and Rutten returned to Monterey on April 17-19, 1980 to fish for euphausiids aboard the San Giovanni II. Two tows, at different depths, were made at night on April 18 in the Monterey Canyon vicinity. The first tow targeted on a deep scattering layer (DSL) trace at 18-20 fathoms, and yielded approximately 125 pounds of euphausiids in two hours. The second tow, also two hours in duration, was made at the 40-fathom mark. No euphausiids were taken.

A sample of the catch from the first tow was collected and preserved on board ship for subsequent determinaton of species present and percent composition by species. This sample is presently being sorted for identification; however, preliminary results indicate that Thysanoessa spinifera was the dominant euphausiid in the catch, rather than Euphausia pacifica, as anticipated.

Fifty pounds of euphausiids were sorted and packed on board ship for freeze-drying tests. Samples of the freeze-dried product will be analyzed for marketability and used to assess the potential for a commercial euphausiid fishery in the Monterey area.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Striped Bass Sampled Continue to Show Abnormalities

Dr. Jeannette A. Whipple and Brian Jarvis began the third year of sampling of prespawning striped bass during their spawning migration this month. The measurement of effects of pollutants and parasites on striped bass and their gametes will continue on these fish and on fish sampled later in the migration. Fish were sampled with the cooperation of the California Department of Fish and Game in the San Joaquin River (off Antioch) and in the Sacramento River (off Clarksburg). Fish examined to date show characteristics similar to previous years, with high levels of parasites, abnormalities, and external lesions. Subsamples are being taken for continuing pollutant analyses.

Personnel working under contract with the State of California Water Resources Control Board (SWRCB) are now working with scientists in the striped bass program at Tiburon Laboratory under the supervision of Marvin Jung, SWRCB. Two technicians, Judy Sakonari and Carol Reilly, are assisting in obtaining additional samples of striped bass from different areas and in the autopsy and analyses of samples. Plans have been made with members of the Oregon Fish Commission for Marvin Jung of the SWRCB and Brian Jarvis of NMFS to collect samples of striped bass in May from the Coos River and Smith River, Oregon, for comparison with the San Francisco-Bay Delta fish. This sample will also be autopsied and subsampled.

Presence of High Levels of Benzene Identified in Field Captured Striped Bass

Nina Hirsch and Richard Pimentel, San Francisco State University, and the staff of the Physiological Ecology Investigation at the Tiburon Laboratory completed a two-week experiment exposing prespawning striped bass to benzene in the laboratory. Benzene has been identified at relatively high levels in field-captured prespawning striped bass. Subsamples and data are being analyzed from this experiment.

Final gas chromatography-mass spectrophotometry verification of gas chromatograph measurements of benzene and other alkylated benzenes in tissues of field-captured striped bass was received this month. Samples analyzed show that relatively high levels of benzene and substituted benzenes are present in liver and ovarian tissues of striped bass in the field, verifying their uptake in the field.

Abstract Submitted for the Pacific Division, AAAS, Annual Meeting

Pete Benville submitted an abstract to AAAS for presentation at their Pacific Division Annual Meeting at the University of California, Davis, June 22-27, 1980. The paper is entitled, "Benzene uptake and depuration by adult striped bass," and was accepted by the AAAS for presentation.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

Fishery Information Network Contracts Awarded

Several Fishery Information Network (FIN) contracts have been awarded by NMFS in the Pacific area. Science Applications, Inc. (SAI) is conducting a study of California Fish and Game (CF&G) marine statistics system. The study will present options on how to improve the basic data collection and data processing of CF&G marine fisheries statistics. SAI has started interviewing users in CF&G, SWR, and SWC on data requirements. A similar study will be started in May on the Hawaii Division of Fish and Game fisheries system. General Services Administration (GSA) is presently performing a computer system study for a regional fishery data system for the Pacific area. GSA will analyze the feasibility of merging the fishery catch data that will be transmitted by the various west coast states and NMFS for use by fishery managers. This data will be aggregated and made available to resource managers for in-season and between-season management. The study will be completed by GSA in May 1980. GSA will give presentation to the Data Goals Committee of the Pacific Marine Fisheries Commission (PMFC) on May 29, 1980.

Other SWFC Data Management Activities

Robert Butler, Computer Programmer, continues to work on the Pacific Cooperative Enforcement System (PACES). Butler is resolving matches of data elements between the national enforcement system and PACES. A training session will be conducted by Butler on May 19 and 20 for the State of California and SWR enforcement officials on use of PACES. Error messages and how to correct them have been documented for the six data bases on PACES.

Richard Parrish of Pacific Environmental Group has reviewed the summary tape of the California Fish and Game sportfish catch data, which ADP produced for him last month. Parrish noted that the summarized element, catch per unit of effort, is missing. Oden Burris has calculated the value of output and is testing the algorithm on a partial data set for review by Parrish.

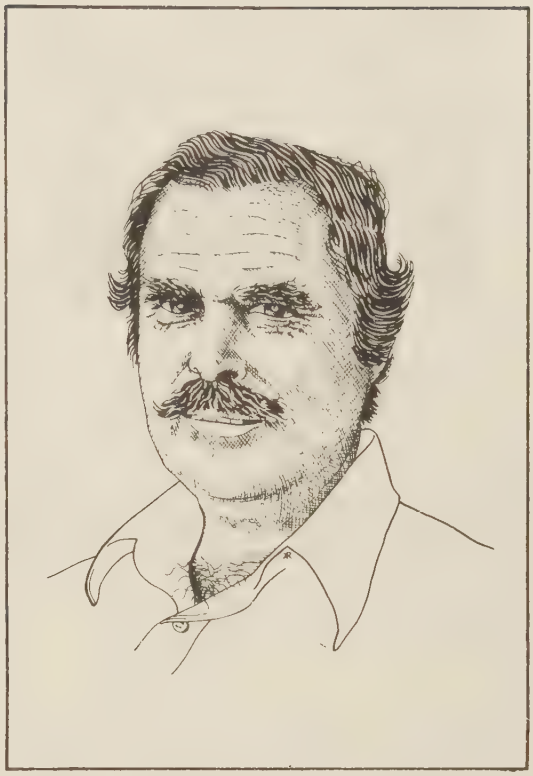
Oden Burris, Computer Programmer, continues maintenance of the FRS (Financial Reporting System) for SWFC and SWR; he has solved the problem with the labor portion of the reimbursable funds.

Mark Sullivan reports that the contract to develop the ability to transfer data (using the NorthStar micro computer) between all computer systems at the La Jolla Laboratories has been approved for issuance by NMFS, NOAA and GSA. The RFP has been distributed to potential vendors and the contract is scheduled to be awarded on June 2, 1980.

MISCELLANEOUS

HONORS AND AWARDS

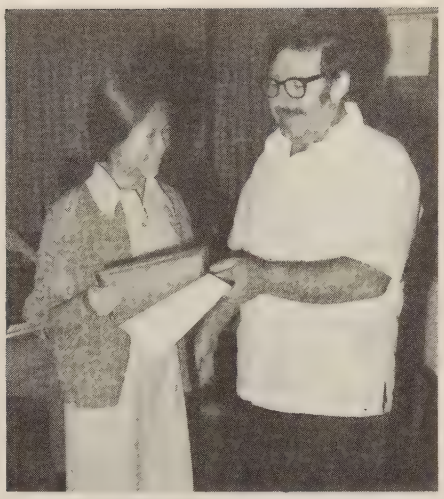
Dr. Eric Barham, Fishery Biologist who retired on April 18 after more than 25 years of government service, was warmly honored by his co-workers at a reception at the Center on April 16.



Dr. Barham who has lived most of his life in San Diego graduated from San Diego State College with honors and later earned his Ph.D. in Biology from Stanford University. He left a professorship at San Diego State College to begin his government career with the Naval Undersea Center in 1956 as a biological oceanographer. He was one of the first scientists to write extensively on the deep scattering layer, a phenomenon he observed and described from a variety of deep submersibles, diving saucers, and bathyscaphs throughout the world oceans.

In 1973, Dr. Barham joined the National Marine Fisheries Service to direct a newly established research program whose objective was to reduce the kill of porpoise taken incidentally in the yellowfin tuna fishery in the eastern tropical Pacific. Subsequently, he served as Special Assistant to the Director of the Southwest Fisheries Center in matters requiring the coordination and integration of new technologies into the U.S. commercial tuna fleet, a position where his tact, diplomacy and ability to deal effectively with people of many diverse backgrounds stood him in good stead. In 1977, Dr. Barham helped mount the first aerial survey to assess the porpoise populations in the eastern Pacific and worked out many of the operational techniques and methods used in subsequent aerial surveys.

Dr. Barham and his wife, Betty, have three grown daughters and two grandchildren. They plan to travel, fish, golf, and may move temporarily to Corvallis, Oregon later this year.



Shown in the accompanying photograph are Dr. Nancy Lo, Statistician at the La Jolla Laboratory, receiving a Certificate of Recognition and a cash award for her contributions toward organizing and analyzing information on the incidental kill of porpoise.

At right, Helen Becker, Clerk-Typist, is being congratulated by her supervisor DeLoris Stringer, Secretary for the Oceanic Fisheries Resources Division, for her outstanding job performance.

SEMINARS

April 1 - Michael McGowan, Tiburon Laboratory, spoke on, "The distribution and abundance of northern anchovy eggs and larvae and coincident plankton in San Francisco Bay, 1978-79."

8 - Dr. Jeannette Whipple, Tiburon Laboratory, discussed, "The eco-genetic perspective of the influence of chronic pollution stress on fishes and the persistence of fisheries populations."

17 - Dr. Tilman Pommeranz, University of Kiel, Kiel, West Germany, presented a lecture on "Investigation of food resources of the Antarctic."

PUBLIC AFFAIRS

Honolulu Laboratory

April 9 - Fishery Biologist R. Uchida served as a judge on the Senior Research Panel at the 23d Hawaiian Science and Engineering Fair sponsored by the Hawaiian Academy of Science and the Hawaii State Department of Education in Honolulu.

- Heeny S. H. Yuen, Fishery Biologist, spoke on the research program of the Honolulu Laboratory at the Professional Maritime Exchange Conference at the Pagoda Hotel. A. Everson presented a brief review of the foreign observer program to the above group.

10 - Director R. Shomura presented a lecture to the Fishery Science (Zoology 466) class of Dr. J.D. Parrish, Leader, Hawaii Cooperative Fishery Research Unit, University of Hawaii.

19 - Shomura presented a talk at the Pacific Islands Studies Conference held at the University of Hawaii Biomedical Science Building.

La Jolla Laboratory

April 15 - Professor Charles Jerde and 7 students from Mesa College participating in his class in, "Field studies in oceanography," visited the Center for a lecture by Dr. Reuben Lasker.

April 17 - As it has for many years past, the Southwest Fisheries Center was host to participants in the Greater San Diego Science Fair on April 17. Ron Lynn, aided by Betsy Stevens and Dr. A. Myrick, made a slide presentation to the 18 Science Fair participants, and later guided them on a tour of the Center's research facilities. Earlier, Director Barrett again served as a judge for the senior participants in the Biology division.

23 - Elaine Sandknop, EEO Counselor for the La Jolla Counseling Area, represented the Southwest Fisheries Center during Career Day at the San Dieguito Union High School. Sandknop provided information for students during seminars on careers in the fisheries service and answered questions at the Career Fair on campus.

VISITORS

Honolulu Laboratory

April 1-2 - Dr. Robert Kearney, South Pacific Commission, Noumea, New Caledonia, worked with Dr. Jerry Wetherall, H. Yoshida, and F. Riggs to revise the, "Summary report of the workshop on the assessment of selected tuna and billfish stocks in the Pacific and Indian Oceans."

10 - Dr. Gareth Nelson, Department of Ichthyology, American Museum of Natural History, Central Park West at 79th St., New York, New York 10024, visited T. Hida regarding fish samples.

11 - Dr. Richard W. Grigg, University of Hawaii, met with R. Shomura and R. Uchida to review last minute details of the symposium on the "Status of Resource Investigations in the Northwestern Hawaiian Islands."

- Dr. Y. Hokama, John A. Burns School of Medicine, University of Hawaii, met with R. Shomura and R. Uchida to discuss ciguatera research.

14 - Dr. Richard Young, Oceanography Department, University of Hawaii, discussed pelagic ecosystem research with R. Shomura and Dr. A. Dizon.

15 - Ms. Anjanette Perry, Graduate Assistant, Oceanography Department, University of Hawaii, visited R. Shomura and W. Gilmartin to discuss Hawaiian monk seals.

23 - SWFC Deputy Director John Carr, SWFC Planning Officer David Mackett, Dr. John L. Munro, Dean of Faculty and Science, University of Papua New Guinea (PNG), Port Moresby, PNG, and Dr. John J. Magnuson, Laboratory of Limnology, University of Wisconsin, Madison, Wisconsin, were in Honolulu to attend the symposium on the Northwestern Hawaiian Islands.

- John E. Byrne, U.S. Fish and Wildlife Service, Portland, Oregon, visited R. Shomura and G. Liao.

La Jolla Laboratory

April 1 - Michael Hearne, California Academy of Sciences, San Francisco, CA.

24 - Ola B. Watford, NOAA, Rockville, Maryland.

28 - Ron Jarman, Management Analyst from Laguna Niguel, at the Center for consultations with John Carr regarding the word processing review.

April 28 - May 9 - Peter Macias, Personnel Specialist with NASO in Seattle, delegated to the Center for two weeks to set the summer employment program, follow-up on personnel actions, and help package performance evaluations.

- The Coastal Division was host to Dr. Jurgen Alheit of the University of Kiel, West Germany for two weeks this month. Dr. Alheit, who studied ichthyoplankton identification with Dr. Moser is on his way to Peru where he intends to set up a program using many of the methods used in CalCOFI.

Pacific Environmental Group

April 18 - D. Ruppel, Lockheed Space Co., Sunnyvale, CA.

25 - Dr. Gary Meyers, Scripps Institution of Oceanography, La Jolla, CA.

Tiburon Laboratory

April 4 - Douglas R. McLain, Pacific Environmental Group, NMFS, Monterey, CA.

- Tom Wilson, Pacific Gas & Electric, Avila Beach, CA.

16 - George Adams, San Francisco State University, San Francisco, CA.

- Bern Bagshaw, San Francisco State University, San Francisco, CA.

17 - Ola B. Watford, Office of Administrative Operations, NOAA, Rockville, MD.

18 - Gregory F. Neuschafer, Fleet Numerical Oceanography Center, Monterey, CA.

- Paul Stevens, Fleet Numerical Oceanogaphy Center, Monterey, CA.

22 - K. Takayama, WESCON INTERNATIONAL, San Francisco, CA.

23 - Neil Thibodaux, Cal Maritime, Vallejo, CA.

25 - Dick Nelson, Northwest and Alaska Fisheries Center, Seattle, WA.

- Mike Orbach, Marine Studies, University of California, Santa Cruz, CA.

28 - Jimmy A. Lyons, OMPA/MESA, Seattle, WA.

29 - Lawrence E. Keisler, OMPA/MESA, Seattle, WA.

- Robert Paria, OMPA, Boulder, CO.

MEETINGS AND TRAVEL

Honolulu Laboratory

April 2 - Drs. M. Adams and J. Polovina and H. Yoshida attended a meeting of the ad hoc working group of the Scientific and Statistical Committee, Western Pacific Regional Fishery Management Council (WPRFMC), to discuss the spiny lobster Fishery Management Plan (FMP).

3 - R. Shomura returned to Honolulu after attending the Marine Biotoxin Review Committee meeting in Washington, D.C.

4 - Drs. Adams and Polovina, R. Uchida and H. Yoshida met with J. Rutka, WPRFMC, S. Fougner and E. Cooney, Southwest Region, NMFS, to discuss the spiny lobster FMP.

6-9 - R. Shomura attended the 23d WPRFMC meeting in Guam and Saipan.

17 - R. Shomura attended the Sea Grant Advisory Council meeting at the University of Hawaii Campus Center.

- R. Shomura, R. Uchida, and B. Ito attended a ciguatera meeting called by the Hawaii State Department of Health.

La Jolla Laboratory

April 1-2 - Iz Barrett and David Mackett were in Seattle, WA to discuss Fishery Management Plans with the Northwest Region and Center and the Southwest Region/Southwest Fisheries Center.

6-8 - Dr. D. Huppert traveled to Corvallis, Oregon to present a seminar concerning models of decisionmaking in anchovy management to staff at Oregon State University.

8-9 - Director Barrett was in Portland, Oregon to attend the Pacific Council's Statistical and Scientific Committee meeting.

13-17 - Dr. G. Stauffer traveled to Seattle, Washington to attend a meeting of U.S. and Soviet scientists and later a workshop of the stock assessment task force writing committee.

13-19 - Dr. T. Smith was in Washington, D.C. to consult with NMFS personnel on the Status of Porpoise Stocks hearings and to participate in the hearings on proposed porpoise regulations.

14-16 - Dr. M. Laurs traveled to Estes Park, Colorado to attend a CODAR workshop on ocean circulation sponsored by NOAA.

21 - Fred Kellenberger and Mark Sullivan traveled to Long Beach to discuss the Fishery Information Network (FIN) with CF&G and the contractor, Science Application, Inc.

20-24 - Barrett traveled to Washington, D.C. to attend the Regional Directors/Center Directors meeting.

21-24 - Drs. R. Lasker and P. Smith were in La Paz, Mexico to discuss population fluctuation of northern anchovy with Mexican scientists.

23-26 - J. Carr and D. Mackett traveled to Honolulu, Hawaii to attend a symposium on the "Status of Resoure Investigations in the Northwestern Hawaiian Islands."

29-30 - Director Barrett chaired the Center Management meeting at SIO's Marine Biology building which was attended by Laboratory Directors R. Shomura, N. Abramson and G. Seckel as well as by Carr, Lasker, Sakagawa, Mackett, Kellenberger and Remington.

Pacific Environmental Group

April 3-4 - Dr. Douglas McLain traveled to Tiburon, CA to participate in close-out activities involving the XBT program.

April 16 - May 16 - Dr. Richard Parrish traveled to Lima, Peru and Santiago, Chile to attend an international workshop sponsored by FAO to discuss comparative studies of the fisheries on pelagic fishes in the Humboldt and California Currents, respectively. Andrew Bakun also attended the workshop where he chaired a session.

April 28-30 - Gunter Seckel traveled to La Jolla, CA to attend the Center Management Meeting.

Tiburon Laboratory

April 1 - Michael F. McGowan traveled to La Jolla, CA to give a presentation on, "The Distribution and Abundance of Northern Anchovy (Engraulis mordax) Eggs and Larvae and Coincident Plankton in San Francisco Bay, 1978-1979" at a seminar held at the Southwest Fisheries Center.

1-3 - Director Norman J. Abramson traveled to the California Department of Fish and Game Laboratory at Menlo Park, California, to attend a meeting of the Pacific Fishery Management Council's Pink Shrimp Management Plan Team. The Plan was modified in response to additional comments from Northwest Region, NOAA General Counsel's Office, and a member of the Council's Scientific and Statistical Committee.

8 - Dr. Jeannette A. Whipple traveled to La Jolla, CA to give a presentation on "Eco-Genetic Perspective of the Influence of Chronic Pollution Stress on Fishes and the Persistence of Fisheries Populations" at a seminar held at the Southwest Fisheries Center.

10 - Sus Kato, Daniel Ralph, and Lt. Patrick Rutten (NOAA Corps) traveled to Monterey, CA to install a Furuno net recording system aboard the fishing vessel San Giovanni II.

- Pete Benville and Brian Jarvis conducted an aerial survey of the Suisun Bay, Montezuma Slough, and lower portion of the Sacramento River, CA to explore the route which will be used by the vessel to collect striped bass samples, and locate an appropriate site for anchoring larvae-rearing pens.

16 - Sus Kato presented results of progress made in the Fisheries Development Investigation during the past year at a Research Council Meeting held at the Tiburon Laboratory. Attendees at the meeting included: Norman J. Abramson, Dr. Edmund S. Hobson, Dr. William H. Lenarz, Dr. Jeannette A. Whipple, Mickey Eldridge, Roger Green, Nancy Wiley, and William Leet (Environmental Assessment Branch, Southwest Region).

17 - Ola B. Watford, Office of Administrative Operations, NOAA, met with Norman J. Abramson at the Tiburon Laboratory, to discuss present and future space needs of our Laboratory.

20-24 - Ed Ueber traveled to Portand, OR to chair the Groundfish Plan Development Team Meeting, and co-chair the meeting of the Groundfish Planning Team, Advisory Panel and NMFS.

22 - Representatives of WESCON INTERNATIONAL and San Francisco Seamaster met with members of the Fisheries Development Investigation at the Tiburon Laboratory, to discuss the economic aspects of the potential euphausiid fishery.

22-23 - Dr. William H. Lenarz met with Gary Smith at the Southwest Region, Terminal Island on April 22. The following day, April 23, he met with Gary Stauffer and Fred Kellenberger at the Southwest Fisheries Center, La Jolla. Subject of discussion at both meetings was the anchovy/brown pelican work.

24-25 - Dr. Edmund S. Hobson participated in a Symposium on the "Status of Resource Investigations in the Northwestern Hawaiian Islands," and gave a presentation on "The Structure of Reef-Fish Communities in the Hawaiian Archipelago." The symposium was held at the University of Hawaii.

25 - Norman J. Abramson, Ed Ueber, and Mike Orbach (University of California, Santa Cruz) met at the Tiburon Laboratory, to discuss cooperative agreements, grants, and proposed joint research.

28-30 - Norman J. Abramson traveled to La Jolla, CA to attend the Quarterly Management meeting at the Southwest Fisheries Center.

29 - Lt. Patrick Rutten traveled to Monterey, CA to deliver a Polish rope trawl to Royal Seafoods and a small mesh cod end for shortbelly rockfish to the fishing vessel, Collintino Rose.

PERSONNEL

Honolulu Laboratory

April 1 - Brent M. Miyamoto, Computer Aid - Completion of Temporary Appointment.

La Jolla Laboratory

April 20 - Nathaniel Kostrubala, Computer Aid - Excepted Appointment.

- Lonnie Dick, Computer Aid - Temporary Appointment.

May 4 - Barbara Engstrand, Program Services Assistant - Promotion.

Tiburon Laboratory

April 6 - Tina Echeverria, Fishery Biologist (General) - Promotion.

18 - Candis L. Cooperrider, Biological Technician - Expiration of Appointment.

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DEPARTMENT OF COMMERCE

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